PICTURE FRAME ASSEMBLY FOR MOUNTING TO A CYLINDRICAL OBJECT

BACKGROUND OF THE INVENTION

The invention relates to a picture frame assembly of the type including a backing plate and at least one frame element for retaining a planar picture element against the backing plate.

Picture frame assemblies including a backing plate and a frame element for retaining a photograph or other planar picture element against the backing element are well known. Such assemblies include means for retaining the backing element in the frame, and may include a sheet of glass or other transparent material over the picture element. Picture frames come in assorted shapes and sizes and are generally flat so that they may be hung flush with a flat surface.

Miniature picture frames are also well known, and are sometimes used as part of a memorabilia display and as elements of memorials. It is sometimes desired to fix the picture frame to a cylindrical object such as a tree, a column, or a candle, but a picture frame assembly which fits flush against a cylindrical object, in particular a picture frame assembly which may be readily adjusted to any desired radius of curvature, is not available.

SUMMARY OF THE INVENTION

It is an object of the invention to provide a picture frame assembly which has a curved backing plate, in particular a curved backing plate which may be plastically deformed to any desired radius of curvature.

It is another object of the invention, to provide a backing plate having a rear surface provided with tack

elements, so that the backing plate may be readily mounted to a penetrable object such as a tree, a rose stem, or a candle. The tack elements may be stamped and formed from apertures in a metal backing plate, provided as discrete tacks fixed to the backing plate, or molded integrally with a plastic backing plate.

It is another object of the invention, to provide a deformable frame for a deformable backing plate, in particular a frame which is formed in one piece with the backing plate.

It is another object of the invention, to provide a picture frame assembly which is sufficiently low in cost that it may be placed at an outdoor memorial without inviting theft.

According to the invention, a picture frame assembly includes a backing plate having a front surface, a rear surface, and a plurality of parallel grooves in one of the surfaces. The material and thickness of the backing plate are chosen so that the backing plate may be plastically deformed about a bending axis parallel to the grooves, while the ribs between the grooves are sufficiently stiff to resist bending about other axes.

The backing plate is also provided with tack elements which may be stamped and formed from apertures in the backing plate to extend normally of the rear surface. Alternatively, the tack elements may be discrete tacks which are fixed to the rear surface.

According to a preferred embodiment, frame elements are formed integrally with the backing plate by bending along grooves parallel to lateral edges.

According to another embodiment, a transparent curved frame plate has lateral edges formed with clips which receive the lateral edges of the backing plate.

According to another embodiment, a frame plate having an aperture is formed as one piece with the backing plate and connected to the backing plate by a fold so that a planar picture element and a protective transparent sheet can be sandwiched between the front surface of the backing plate and the rear surface of the frame plate. The frame plate preferably has retaining tabs which can be folded against the rear surface of the backing plate to retain the picture element.

According to an embodiment designed for an object having a known diameter, such as a candle, a frame element is provided with a curved frame plate having an aperture and a surrounding wall having an edge with a radius of curvature which is smaller than that of the frame plate. The edge is provided with retaining tabs which are deformed to bear against the rear surface of the backing plate, which is received within the surrounding wall. The plastic deformability of the backing plate assures that a picture element will be held flush against the rear surface of the frame plate, together with an optional transparent sheet, giving a neat appearance.

Since the picture frame assembly according to the invention may be economically manufactured by molding plastic and/or stamping and forming sheet metal, it may be left at an outdoor memorial without significant risk of theft.

BRIEF DESCRIPTION OF THE DRAWINGS

Figure 1A is a perspective of a backing plate according to the invention;

Figure 1B is a top view of the backing plate prior to bending;

Figure 1C is a top view of the backing plate after bending;

Figure 2A is an exploded perspective of a first embodiment of picture frame assembly according to the invention;

Figure 2B is a top view of the backing plate and cover of the first embodiment;

Figure 3A is an exploded perspective of a second embodiment of picture frame assembly according to the invention;

Figure 3B is a top view of the backing plate of the second embodiment prior to bending;

Figure 3C is a perspective of the retaining tab formed integrally with the frame element of the second embodiment;

Figure 4A is a perspective of a third embodiment wherein a frame plate is integrally formed with the backing plate;

Figure 4B is a perspective of a modified form of the third embodiment;

Figure 5A is an exploded perspective of a fourth embodiment having a curved frame plate and surrounding wall;

Figure 5B is a top view of the fourth embodiment; and

Figure 5C is a side view showing a cover hinged to the frame element.

DETAILED DESCRIPTION OF THE PRESENTLY PREFERRED EMBODIMENTS

Figures 1A to 1C show a backing plate 10 having a front surface 12, a rear surface 13, a plurality of parallel grooves 14 in the front surface 12, and a pair of lateral edges 16 parallel to the grooves 14. A pair of tack elements 20, 22 are stamped from respective apertures 21, 23 and formed to extend normally of the rear surface 13. Both tack

elements 20, 22 are preferably formed along a common bending axis parallel to the grooves. The material chosen for the backing plate 10, as well as its thickness and the depth of the grooves 14, are chosen to facilitate plastic deformation from the flat configuration of Figure 1B to the curved configuration of Figure 1C. At the same time, the ribs 15 between the grooves 14 are sufficiently stiff to resist bending about axes which are not parallel to the grooves. The material is preferably metal such as sheet aluminum, but may also be plastic. The grooves 14 may be formed by stamping (metal material) and are not present in the tack elements 20, 22, which must be relatively stiff to penetrate a tree trunk. The tack elements are preferably of different lengths, the longer element 20 assuring good retention, the shorter element 22 serving primarily as an orientation feature. While the grooves are shown in the front surface 12, they may alternatively be provided in the rear surface 13.

The elliptic lines 17 shown in phantom in Figure 1A serve as a guide for cutting the backing plate 10 to any desired shape, in particular symmetric shapes such as an ellipse.

Figures 2A and 2B show the backing plate 10 of Figure 1A, and a transparent frame plate 30 having a pair of lateral edges 32 formed with U-shaped clips 33 for receiving the lateral edges 16 of the backing plate 10. A planar picture element such as a photograph may be received between the backing plate 10 and the frame plate 30, which is preferably plastic such PMMA and also serves as a protective cover for the photograph. Alternatively, the frame plate 30 may be made of metal and provided with an aperture 35, shown in phantom, as well parallel grooves (not shown) to facilitate bending.

Figure 3A shows a backing plate 10 which is similar to that of Figure 1A, with the lateral edges 16 each folded forward along the two grooves 14 adjacent to the edge to form lateral frame elements 18 for retaining a photograph 29 and a transparent sheet 28 against the front surface 13. As shown in Figure 3B, the frame elements 18 are preferably formed prior to bending the plate 10 to its curved configuration. As shown in Figure 3C, each frame element 18 has at least one end formed with a retaining tab 19 which serves as a stop to prevent a picture element 29 from sliding parallel to the grooves 14. The triangular shape of the tab 19 prevents frame element 18 from being folded too far, which could overstress the thin material in the bottom of the second groove 14. The transparent sheet 28 is preferably acetate or like material which does not have sufficient elasticity to reverse the plastic deformation of the backing plate 10.

Figure 4A shows a picture frame assembly wherein the frame plate 40 is formed integrally with the backing plate 10 and connected thereto by a fold 41. The frame plate 40 has an aperture 42, a front surface provided with grooves 43, and an opposed rear surface 44 which faces the front surface 12 of the backing plate 10. The top edge 46 and the bottom edge 48 are provided with retaining tabs 48 which are bent against the rear surface 13 of the backing plate 10 to secure a picture element such as a photograph between the plates 10, 40. Optionally, a transparent sheet such as sheet 28 in Fig. 3A may be also provided. Figure 4B shows an alternative configuration wherein lateral retaining tabs 49 are provided; these tabs may also be provided in addition to the tabs 48. An alternative shape of aperture 42 is also shown.

Figures 5A and 5B show a frame element 50 including a curved frame plate 52 having a front surface 53 and a rear surface 54 which receives a planar picture element visible through aperture 55, possibly with a protective transparent

sheet . A surrounding wall 56 extends rearward from the periphery of the frame plate 52 to an edge 57 lying in a cylindrical plane having a radius of curvature which is smaller than that of the frame plate 52. The backing plate 10 is received within the surrounding wall 56 and held against a picture element by plastically deformable retaining tabs 58 extending from the edge 57. The backing plate 10 is shown with alternative tack elements in the form of discrete tacks 24, 26 which are soldered or brazed to the rear surface 13 of the backing plate. While not as economic to manufacture as the stamped tack elements 20, 22 shown in other figures, the tacks 24, 26 are available as a staple and are more sturdy. As best shown in Figure 5B, the surrounding wall has its lowest height along a line formed by the two tacks 24, 26. Since the frame element is not intended to be deformed by a user, the radius of curvature of the rear edge 57 is preferably chosen to correspond to the diameter of a particular object to be decorated, in particular a candle. This makes it possible to create a stylish memorial utilizing a photograph of a loved one.

Figure 5C shows a modification of the picture frame assembly of Figures 5A and 5B, wherein a cover 59 is hinged to the frame element 50 to form a locket. A gasket may also be provided to protect the aperture from exposure to the elements. Gaskets or adhesive seals may also be provided in any embodiment wherever it is desired to prevent influx of moisture.

The foregoing is exemplary and not intended to limit the scope of the claims which follow.